

UNITED STATES DISTRICT COURT
DISTRICT OF RHODE ISLAND

FILED

2013 MAR -4 P 2: 59

UNITED STATES OF AMERICA

v.

JOSEPH CARAMADRE, and
RAYMOUR RADHAKRISHNAN

U.S. DISTRICT COURT
DISTRICT OF RHODE ISLAND

Criminal No. 1:11-cr-00186-S

**MEMORANDUM OF LAW IN SUPPORT OF
MOTION TO ADMIT POLYGRAPH EVIDENCE**

**I. THE ADMISSIBILITY OF POLYGRAPH EVIDENCE IS TO BE
EVALUATED PURSUANT TO FRE 702 AND DAUBERT STANDARDS.**

Modern consideration of polygraph evidence and, coincidentally, scientific evidence in general began with the seminal case of *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).¹ There, the defendant Frye appealed his conviction for murder on the ground that the trial court erroneously refused to admit defense evidence based on a systolic blood pressure deception test, a crude precursor to the present-day polygraph. In fact, the systolic blood pressure deception test used in *Frye* was not a polygraph test at all² but was based on a periodic sampling of readings from a simple blood pressure cuff during a dialogue with the defendant concerning the alleged crime.³ These blood pressure recordings were not continuous, and no apparent formal questioning technique or analysis

¹ Prior to *Frye* the court's typical inquiry regarding admissibility of scientific evidence was only whether the expert was "qualified." A. Osborn, *Reasons and Reasoning in Expert Testimony*, 2 Law & Contemp. Probs., 488, 489 (1935).

² "Poly" meaning "many" refers to the multiple areas of physiological response recorded by the modern polygraph instrument. The modern polygraph instrument and testing techniques are discussed in more detail in section H(A)(1) of this brief.

³ As described in *United States v. Galbreth*, 908 F.Supp. 877, 883 (D.N.M. 1995): "The machine scrutinized in *Frye* was a standard blood pressure type device comprised of a microphone and a cuff that measured the subject's blood pressure. The examiner asked the subject a series of questions during which time the examiner periodically took the subject's blood pressure."

was conducted. C. Honts & B. Quick, *The Polygraph in 1995: Progress in Science and the Law*, 71 N.D. L. Rev. 987, n.3 (1995) [hereinafter Honts & Quick, *The Polygraph in 1995*].

Although the *Frye* court's decision was short and citation-free, its holding, which became known as the "*Frye* test," went far beyond the particular evidence under review and set what became the general standard for evidentiary review of scientific evidence.

The *Frye* court noted:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs.

Frye, 293 F. at 1014. As to the unsophisticated systolic blood pressure deception-testing test, the *Frye* court concluded that it had not gained sufficient acceptance among physiological and psychological authorities to be admissible.

The *Frye* test dominated the admissibility of scientific evidence in general, and polygraph evidence in particular, for the next seventy (70) years. During that time, while other forms of novel scientific evidence were deemed to have developed the level of acceptability mandated by *Frye*, the advances in the study of psychophysiology, as applied to polygraph testing, went all but ignored by the courts. J. McCall, *Misconceptions and Reevaluation - Polygraph Admissibility After Rock and Daubert*, 1996 U. 111. L. Rev. 363 (1996) [hereinafter McCall, *Misconceptions and Reevaluation*].

There were occasional exceptions to the exclusionary trend, such as *United States v. Piccinonna*, 885 F.2d 1529 (11th Cir. 1989). *Piccinonna* provided the first thorough federal judicial consideration of the modern polygraph and determined that "since the *Frye* decision, tremendous advances have been made in polygraph instrumentation and technique." *Id.* at 1532. The court further noted that "the FBI, the secret service, military intelligence and law enforcement agencies use the polygraph"; that "in recent years polygraph testing has gained increasingly widespread acceptance as a useful and reliable scientific tool"; and that "a *per se* rule disallowing polygraph evidence is no longer warranted." *Id.* at 1535. The *Piccinonna* court went on to articulate standards for polygraph admissibility in the Eleventh Circuit - a decision that is in force today but is often honored in its breach. See *United States v. Padilla*, 908 F.Supp. 923 (S.D. Fla. 1995); *Elortegui v. United States*, 743 F.Supp. 828 (S.D. Fla. 1990); *United States v. Gilliard*, 133 F.3d 809 (11th Cir. 1998) (applying *Piccinonna* but upholding exclusion of polygraph evidence).

Over time the *Frye* general acceptance test came under severe criticism by courts and commentators as overly conservative. The standard was vague, obscured the relevant inquiries, and deprived courts and parties from the use of important scientific evidence while such evidence endured the inevitable gestation and debates within the scientific community. D. Faigman et al., *Modern Scientific Evidence: The Law and Science of Expert Testimony*, § 1:5 (2005-2006). Additionally, the *Frye* test required general acceptance in the particular relevant field of the scientific community, a requirement that was difficult to apply as scientific information often extends into multiple academic disciplines and sub-disciplines. See P. Giannelli, *The Admissibility of Novel Scientific*

Evidence: Frye v. United States, a Half Century Later, 80 Colum. L. Rev. 1197, 1209 (1980).

The Supreme Court of the United States expressly replaced the *Frye* test for determining admissibility of scientific evidence in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U. S. 579, 587 (1993). *Daubert* concluded that the austere *Frye* approach of relying on general acceptance in the scientific community to recognize scientific developments was too restrictive, given the more liberal approach to admissibility of the modern federal rules of evidence in general and, in particular, FRE 702. FRE 702, in its current form, provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

Pursuant to *Daubert*, the trial court is the gatekeeper responsible for determining the admissibility of scientific testimony. To fulfill this gatekeeping function district courts often hold “*Daubert*” or FRE 104 hearing, outside the presence of a jury, to assess whether the tendered scientific evidence meets *Daubert* and Rule 702 standards.⁴ While such hearings are discretionary and not always necessary, a failure to provide an opportunity for such hearing might, under certain circumstances, constitute an abuse of discretion. *See, e.g., United States v. Smithers*, 212 F.3d 306 (6th Cir. 2000). Whether a

4. As the gatekeeping function is, in part, directed at a concern that jurors might sometimes be overwhelmed or confused by technical evidence of questionable merit some courts have applied a more lenient standard in bench trials. *See, e.g., Smithkline Beecham Corp. v. Apotex Corp.*, 247 F.Supp.2d 1011 (N.D. Ill. 2003), *aff'd*, 403 F.3d 1331 (Fed.Cir. 2005) cert. denied, — U.S. —, 2006 WL 1667007 (June 19, 2006).

Rule 104 hearing is held or not, the district court must create a sufficient record so that the decision on whether to admit the subject scientific testimony can be reviewed. As stated by the Tenth Circuit Court of Appeals in *Goebel v. Denver and Rio Grande Western R. R. Co.*, 215 F.3d 1083,1088 (10th Cir. 2000):

Without specific findings or discussion on the record, it is impossible on appeal to determine whether the district court "carefully and meticulously" review[ed] the proffered scientific evidence or simply made an off-the-cuff decision to admit the expert testimony.

Daubert provided some general guidelines in determining whether the offered evidence is based on scientific knowledge - that is, whether it has been derived by the scientific method rather than unsupported speculation. Notably, in contrast to *Frye*, the Supreme Court in *Daubert* did not find that there was an automatic bar to admission of scientific evidence where the scientific community was divided about the science.

The relevant factors suggested by the *Daubert* opinion included: (1) whether the theory or technique on which the testimony is based is capable of being tested; (2) whether the technique has a known rate of error in its application; (3) whether the theory or technique has been subjected to peer review and publication; (4) the level of acceptance in the relevant scientific community of the theory or technique; and (5) the extent to which there are standards to determine acceptable use of the technique. As was later verified in *KumhoTireCo. v. Carmichael*, 526U.S. 137,152-53 (1999), none of the factors suggested in *Daubert* was to be rigidly dispositive, and the inquiry was to be a flexible one, keeping in mind the competing needs of keeping untrustworthy pseudoscience from the jury and of keeping the courts open to scientific developments.

The United States Supreme Court has never addressed the admissibility of polygraph evidence under *Daubert*. The only time the Court has faced any substantial

issue regarding polygraph evidence admissibility was in *United States v. Scheffer*, 523 U.S. 303 (1998). Consideration of *Scheffer*, here, is appropriate as *Scheffer* is often misread as a basis for categorical exclusion of polygraph evidence.

The *Scheffer* case originated in the military courts. The United States Armed Forces have for many years studied and used the polygraph, and, beginning with *United States v. Gipson*, 24 M.J. 246 (C.M.A. 1987), the military courts formally recognized the scientific reliability of the polygraph and the propriety of its use as evidence. The executive branch of the federal government responded to *Gipson* by issuing a new military rule of evidence to impose a *per se* exclusion on polygraph evidence for the military courts, precluding any possibility of making a showing of scientific reliability or relevance. *Scheffer* tested the constitutionality of that *per se* exclusion under those provisions of the Sixth Amendment that guarantee the right of the accused to have his defense evidence heard. That theory had previously been relied on to strike down evidentiary bans on the ability of the accused to introduce exculpatory hearsay statements, accomplice testimony, and hypnotically refreshed testimony. G. Dery, *Mouse Hunting With an Elephant Gun: The Supreme Court's Overkill in Upholding a Categorical Rejection to Polygraph Evidence in United States v. Scheffer*, 26 Am. J. Crim. L. 227 (Spring 1999).

The defendant Scheffer was an airman charged with using drugs and, as part of the investigation, had been administered both a urinalysis and a polygraph by the Air Force. The urinalysis expert concluded that traces of methamphetamine were found in his urine, and the polygraph expert reported that the airman did not show signs of deception when he denied knowingly ingesting the drugs. As a result of the new exclusionary

evidence rule, the court martial panel was not allowed to hear the polygraph evidence while the urinalysis analysis was admitted. The airman appealed his resulting conviction, and the court of appeals for the Armed Forces held that a rule imposing a *per se* exclusion of polygraph evidence violated the airman's Sixth Amendment right to present a defense. The government took the case to the United States Supreme Court, which reversed the court of appeals and reinstated the conviction.

Those who hoped the *Scheffer* opinion would provide some definitive answers to the issues surrounding polygraph use in United States courts found little resolution in the decision. See Comment, *Between a Rock and a Hard Place: Polygraph Prejudice Persists After Scheffer*, 47 Buffalo L. Rev. 1533 (1999). There were, in fact, three separate opinions in *Scheffer*, none garnering the full support of a majority of the nine-member Court.

The only clear majority holding from the Court's opinion is that if a jurisdiction, by formal evidentiary rule, chooses to exclude polygraph evidence, it is not absolutely precluded to do so by the United States Constitution, at least at the present time. That conclusion was shared by the four justices supporting the Thomas opinion ("The Thomas four" - Thomas, Rehnquist, Scalia, and Souter) and the four justices supporting the Kennedy opinion ("The Kennedy four" - Kennedy, O'Connor, Ginsburg, and Breyer).

Only the Thomas four believed that the *per se* exclusion was appropriate. The Kennedy four reluctantly joined the Thomas four on the constitutional issue to avoid binding all court systems in the country to a constitutional ruling that they have no power to choose to exclude polygraph evidence, joining only on the ground that the rule of exclusion was not so arbitrary or disproportionate that it was unconstitutional. The

Kennedy four went on to say, however, that they did not agree that the *per se* exclusion was wise and that a later case might cause them to re-examine their agreement with the constitutionality of the exclusionary position. The Kennedy four also noted the tension between the *Scheffer* result and the *Daubert* doctrine as well as the inconsistency between the government's oppositionist position to the use of polygraphs by the accused while it makes widespread use of polygraph tests in conducting its own business.

Justice Stevens was clear in his separate dissent that the courts should be open to admission of polygraph results and that the Sixth Amendment does prohibit a *per se* exclusion of polygraph evidence.⁵

The plurality opinion of the Thomas four has been justly criticized as flawed and inconsistent with Sixth Amendment jurisprudence on the right of the accused to present a defense. E. Imwinkelried, *A Defense of the Right to Present Defense Expert Testimony: The Flaws in the Plurality Opinion in United States v. Scheffer*, 69 Term. L. Rev. 539 (Spring 2002). In any event, *Scheffer* resulted in no resolution of the *Daubert* question for polygraphs in the federal courts.

A number of lower courts have been confronted with the implications of *Daubert* for the admissibility of polygraph evidence. Some have acknowledged that the rigid exclusionary stance of the *Frye* years was no longer justified and that a fresh *Daubert* analysis was required. *United States v. Cordoba*, 104 F.3d 225,228 (9th Cir. 1997); *United States v. Pulido*, 69 F.3d 192,205 (7th Cir. 1995); *United States v. Posado*, SI F.3d 428,423-34 (5th Cir. 1995).

⁵ Justice Stevens' separate opinion contains the single-most thorough judicial analysis ever written about the scientific and legal issues involving polygraph evidence.

Several of the more thorough analyses of the *Daubert* factors in reported trial court opinions resulted in findings that the modern control question polygraph is scientific evidence which should be admitted under FRE 702. *United States v. Galbreth*, 908 F.Supp. 877, 895-96 (D.N.M. 1995); *United States v. Crumby*, 895 F. Supp. 1354, 1365 (D. Ariz. 1995); *Ulmer v. State Farm Fire & Casualty Co.*, 897 F. Supp. 299,303-04 (W.D. La. 1993). However, a number of the *post-Daubert* opinions continue to express reluctance to change their exclusionary positions on polygraph evidence. *See Cordoba*, 104 F.3d at 227 ("we have long expressed our hostility to the admission of unstipulated polygraph evidence"), and *United States v. Call*, 129 F.3d 1402,1405 (10th Cir. 1997) ("our holding [that *Daubert* allows a possibility of admitting polygraph] does not suggest a newfound enthusiasm for polygraph evidence").

Some of the theories cited by courts in opposition to polygraph evidence are either inexplicable in themselves or impossible to reconcile with each other. For example, in *United States v. Pulido*, 69 F.3d 192, 205 (7th Cir. 1995), a federal appeals court excluded a key government witness's polygraph evidence where the results were deemed peripheral to the "core issues," while the very same year, in *United States v. Sherlin*, 67F.3d1208,1217 (6th Cir. 1995), a federal appeals court in an adjacent circuit excluded another defendant's polygraph because his credibility "was maybe the central issue in this case." *See generally* E. Imwinkelried & J. McCall, *Issues Once Moot: The Other Evidentiary Objections to the Admission of Polygraph Examinations*, 32 Wake Forest L. Rev. 1045 (1997).

One of the most common exclusionary techniques is the use of FRE 403, which allows a trial judge to disregard other rules of admissibility and exclude evidence that is

relatively weak or may cause confusion, consume too much time, or cause unnecessary prejudice to a party. This approach has been used to avoid a court even having to hold a *Daubert* hearing or consider any of the scientific realities. *United States v. Perez*, 295 F.3d 249,254-55 (2d Cir. 2002); *United States v. Lea*, 249 F.3d 632, 638-40 (7th Cir. 2001); *United States v. Benavidez-Benavidez*, 217 F.3d 720,724-25 (9th Cir. 2000); *United States v. Call*, 129F.3d 1402,1405 (10th Cir. 1997); *United States v. Kwong*, 69F3d 663, 668-69 (2d Cir. 1995), *cert denied*, 517 U.S. 1115 (1996) ("assuming that polygraph results are admissible under Rule 702" but not reaching that holding because the record was insufficiently developed and the results were properly excluded under Rule 403). There is no other type of evidence which has ever been categorically deemed inadmissible under this rule, with the courts in non-polygraph situations relying instead on case-specific factors to determine propriety of use of the rule. With polygraph, FRE 403 often, and improperly, becomes a categorical evidentiary blackball.

Often clearly articulated and equally often implicit in the exclusionary opinions is a pervasive apprehension that the introduction of polygraph evidence would wreak some fundamental change in the American judicial system of determining truth. *United States v. Barnard*, 490 F.2d 907,912 (9th Cir. 1973), *cert, denied*, 416 U.S. 959 (1974). Polygraph testimony is viewed by those courts as something that should be excluded "because it usurps a critical function of the jury and because it is not helpful to the jury." *United States v. Call*, 129 F.3d 1402,1406 (10th Cir. 1997).

The exclusionary opinions fail to understand the nature of polygraph evidence. The polygrapher is not dictating how the case should be decided or even whether the test subject is telling the truth from the witness stand. The testimony is simply that on a

previous occasion out of court, the subject exhibited measurable psychophysiological responses shown by scientific study to be indicative of a likelihood of consciousness of truth or deception as to the particular answers to the relevant polygraph questions.

Juries have traditionally been encouraged to consider observations of external demeanor as guides to determining consciousness of truthfulness or deception by a witness, despite the known difficulties in making accurate judgments in that manner. Flight, evidence tampering, obstruction of justice, and numerous other physical activities reflecting consciousness of guilt have routinely been admissible in all courts. E. Imwinkelried, *Uncharged Misconduct Evidence*, Sec. 3.04 (1996). Similarly, circumstantial evidence of subjective consciousness of innocence is admissible "as relevant to show defendant's lack of guilty knowledge." J. Weinstein and M. Berger, *Weinstein's Federal Evidence* 401.08[4] at 401-59 (2d ed. 1997). The polygraph simply provides another, and arguably more accurate, form of circumstantial evidence of consciousness of guilt. See *United States v. Scheffer*, 523 U.S. 303, 332 (1998) (Stevens, J., dissenting). It is also important that "[n]o constitutional provision, law, or rule requires the automatic exclusion of expert testimony simply because it concerns a credibility question." *United States v. Shay*, 57F.3d 126,131 (1st Cir. 1995).

A related expressed fear, in some exclusionary opinions, is that a lay jury is incapable of processing rationally the testimony of the polygraph expert, who will have "an aura of near infallibility, akin to the ancient oracle of Delphi."⁶ *United States v.*

⁶ The oracle of Delphi was located on the slopes of Mount Parnassus, Greece, and was where, tradition held, a priestess, inspired by Zeus and inhaled vapors that emerged from the ground at the site, pronounced prophesies. See C. Morgan, et al, *Athletes and Oracles: The Transformation of Olympia in the Eighth Century B.C.*, Cambridge Univ. Press, p. 151 (1990). Although the court's reference to the oracle is colorful, it would seem hardly appropriate to compare the level of sophistication of modern juries to that of pre-rational Eighth Century B.C. Europe.

Alexander, 526 F.2d 161,168 (8th Cir. 1975). The United States Supreme Court appeared to have put this kind of argument to rest when it overruled *Frye* in *Daubert*:

Respondent expresses apprehension that abandonment of "general acceptance" as the exclusive requirement for admission will result in a "free-for-all" in which befuddled juries are confounded by absurd and irrational pseudo-scientific assertions. In this regard Respondent seems to us to be overly pessimistic about the capabilities of the jury, and of the adversary system generally. Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional and appropriate means of attacking shaky but admissible evidence.

Daubert, 509 U.S. at 595-96. That admonition in *Daubert*, however, has not been heeded in the multitude of cases in other jurisdictions relying on speculations of undue jury influence in rejecting admissibility of polygraph. Those opinions rarely refer to any actual research or experience to support the view that the jury will be unduly swayed by polygraph testimony; instead, if they rely on anything beyond an *ipse dixit* assertion, they merely rely on the unsupported statements to that effect in prior opinions. *See, e.g., United States v. Wright*, 22 F.Supp.2d 751, 755 (W.D. Tenn. 1998); *State v. Dean*, 307 N.W.2d 628, 650-53 (Wis. 1981). The few opinions that refer to actual studies on the subject find no evidence to support the fear that the polygraph evidence will confuse or mislead the jury. *See, e.g., United States v. Piccinonna*, 885 F.2d 1529,1535 (11th Cir. 1989) (there is "a lack of evidence that juries are unduly swayed by polygraph evidence"); *United States v. Starzecpyzel*, 880 F.Supp. 1027,1048-49 (S.D.N. Y. 1995); *United States v. Galbreth*, 908 F.Supp. 877, 895 (D.N.M. 1995). *See also United States v. Scheffer*, 523 U.S. at 337 (Stevens, J., dissenting).

Scientific study supports the conclusion that jurors are not unduly influenced by

polygraph evidence. See E. Carlson et al., *The Effect of Lie Detector Evidence on Jury Deliberations: An Empirical Study*, 5 J. Pol. Sci. & Admin. 1148 (1977); A. Markwart & B. Lynch, *The Effect of Polygraph Evidence on Mock Jury Decision-Making*, 7 J. Pol. Sci. & Admin. 324 (1979); R. Peters, *A Survey of Polygraph Evidence in Criminal Trials*, 68 A.B.A. J. 162,165 (1982). Commentators generally agree with this assessment. See C. Honts & M. Perry, *Polygraph Admissibility: Changes and Challenges*, 16 Law & Hum. Behav. 357, 366 (1992) ("[s]tudies tend to show that juries are more inclined not to give extraordinary weight to polygraph evidence"); McCall, *Misconceptions and Reevaluation*, at 376 ("[t]he continued use of the undue deference rationale for the denial position also demeans the ability of modern juries").

A prominent commentator has, as to the issue of jury ability to evaluate technological information, observed:

Universality of education and the almost instantaneous dispersal of information through modern technology have created a citizenry with a remarkable and historically unique breadth of knowledge, perception, and sophistication. These mature men and women should be treated with the respect they deserve. Excluding information on the ground that jurors are too ignorant or emotional to evaluate it properly may have been appropriate in England at a time when a rigid class society created a yawning gap between royal judges and commoner jurors, but it is inconsistent with the realities of our modern American informed society and the responsibilities of independent thought in a working democracy.

Lee v. Martinez, 96 P.3d 291,297 (N.M. 2004) (quoting J. Weinstein and M. Berger, *Weinstein's Federal Evidence* xix (2d ed. 2003)).

Another fear expressed with regard to polygraph evidence is that the issue of witness credibility will be taken from the jury. However, polygraph evidence is not the

only type of evidence which may be offered regarding indicators of witness credibility. In *United States v. Cacy*, 43 M.J. 214,218 (1995), the court observed that it is usually permissible to allow an expert to testify as to whether "a victim appears rehearsed or coached, or is feigning." Testimony has also been permitted regarding whether "counter-intuitive conduct, such as recanting an accusation, inconsistent statements, or failing to report abuse is not necessarily inconsistent with the truthful accusation." *United States v. Scheffer*, 44 M.J. 442,446 (C.M.A. 1996), *rev'd* 523 U.S. 303 (1998).

Many courts purporting to employ a *Daubert* analysis impose upon polygraph a uniquely high burden of accuracy that is used against no other form of evidence. As discussed in more detail in Section 11(A)(2), *infra*, the majority of laboratory and field studies place the accuracy rates of the results of a properly conducted comparison question polygraph test in the mid to high 80th percentile. *See also United States v. Crumby*, 895 F. Supp. 1354, 1355 (D. Ariz. 1995); *United States v. Galbreth*, 908 F.Supp. 877, 886 (D.N.M. 1995). The court systems in the United States routinely admit evidence with much lower accuracy rates, such as eyewitness identifications, plea-dealing informant testimony, and the like.⁷ With regard to scientific testimony in particular, the courts have upheld handwriting comparisons, predictions of future dangerousness, inkblot analyses, and other psychiatric diagnoses, even though the data show them to be less accurate than polygraph results. *See D. O'Conner, The Polygraph: Scientific Evidence at Trial*, 37 Naval L. Rev. 97,106 (1988).

Moreover, psychiatrists and other clinicians have been permitted to provide expert opinion testimony as to whether a party is malingering or accurately representing his

⁷ The comparison of the accuracy of polygraph to other forms of evidence routinely accepted by the courts was the subject of Crewson, *Comparative Analysis of Polygraph With Other Screening and Diagnostic Tools*, 32 Polygraph 2 (2003), considered in detail in Section 11(A)(2), *infra*.

competency, injury, or disability. *See, e.g., United States v. Denny-Schaffer*, 2 F.3d 999, 1009 n.8 (10th Cir. 1993). While such opinions may be based on clinical impressions alone (*Liles v. Saffle*, 945 F.2d 333,337-39 (10th Cir. 1991)), such testimony may also be based on certain psychological tests, in particular, internal validity scales of the Minnesota Multiphasic Personality Inventories (MMPI). *See, e.g., United States ex rel. sec. v. Billingsley*, 766 F.2d 1015,1026 (7th Cir. 1985) (in which experts described the MMPI as "a test that has numerous scales, designed to elicit malingering or an attempt to ... lie"). As set forth by Faust et al., the use of such internal validity scales of the MMPI are supported by a "body of validating research" which supports detection of malingering. 1 D. Faust et al., *Brain Damage Claims: Coping with Neuropsychological Evidence* 429 (1991). Interestingly, that research demonstrates a validity rate comparable to polygraphs.⁸

The court in *Posado* recognized the unique treatment of polygraph evidence, writing:

Current research indicates that, when given under controlled conditions, the polygraph technique accurately predicts truth or deception between seventy and ninety percent of the time. Remaining controversy about test accuracy is almost unanimously attributed to variations in the integrity of the testing environment and the qualifications of the examiner. Such variation also exists in many of the disciplines and for much of the scientific evidence we routinely find admissible under Rule 702.

Posado, 57 F.3d at 434 (footnotes omitted).

State courts have taken widely varying stances on the admissibility of polygraph

⁸ Research has demonstrated the F minus K index as a reasonably accurate discriminator. H. Gough, The F Minus K Dissimulation Index for the MMPI, 14 J. Consulting Psych. 408 (1950) (depending on the cut-off applied, correctly identified authentic profiles between 88% to 97.5% of time while correspondingly misidentifying simulated profiles 12% to 28% of the time).

results during court proceedings. While many states continue an outright rejection of polygraph evidence, there is a clear trend to permit its admissibility upon stipulation of the parties. *Compare Commonwealth v. Mendes*, 547 N.E.2d 35, 39-40 (Mass. 1989), with *Jackson v. State*, 735 N.E.2d 1146, 1153-54 (Ind. 2000).⁹ There is a split of authority regarding the admissibility of evidence of polygraph in suppression, sentencing, and post-conviction proceedings. *Compare Billups v. Commonwealth*, 630 S.E.2d 340, 354-55 (Va. App. 2006); *State v. Lumley*, 977 P.2d 914, 917-21 (Kan. 1999); and *People v. McKinney*, 357 N.W.2d 825, 828 (Mich. App. 1984), with *State v. Pierce*, 138 S.W.3d 820, 825-26 (Tenn. 2004). Polygraph evidence has also been permitted by some courts in administrative proceedings. *See, e.g., Evans v. DeRidder Mun. Fire*, 815 So.2d 61, 71 (La. 2002). *But see Harris v. Novello*, 714 N.Y.S.2d 365, 368 (N.Y.A.D. 3 Dept. 2000). Still other courts are permitting polygraph evidence in bench trials. *See, e.g., State v. Domicz*, 873 A.2d 630, 656-58 (NJ. Super. Ct. App. Div. 2005). *But see State v. Carpenter*, 734 So.2d 866, 872 (La. App. 1999).

New Mexico has, for many years, generally permitted the introduction of unstipulated polygraph evidence. The New Mexico Supreme Court initially found in favor of the admissibility of unstipulated polygraph evidence in *State v. Dorsey*, 539 P.2d 204 (N.M. 1975). There, a defendant appealed the trial court's exclusion of his polygraph examination. In reversing the trial court the New Mexico Supreme Court held that the rule of inadmissibility was mechanistic in nature, inconsistent with the concept of due process, repugnant to the announced purpose and construction of the new rules of evidence, and particularly incompatible with the purpose and scope of the scientific

⁹ Eighteen states have now expressly permitted admission of polygraph evidence by stipulation. *See* N. Ansley & G. Vaughan, *Polygraph Quick Reference Guide to the Law*, 17th ed., American Polygraph Association (2002). Many other states simply do not have a reported decision addressing this issue.

evidence and the relevance rules, which focus on whether the evidence will offer any help to the trier of fact in deciding the issue. Later, the New Mexico Supreme Court codified admissibility of polygraph evidence in N.M.R.E. 11-707, wherein strict provisions for polygraph examiner qualifications and testing protocol were established.¹⁰

The New Mexico Supreme Court was recently, in *Lee v. Martinez*, called upon to consider whether to repeal N.M.R.E. 11-707 and its rule of polygraph admissibility and hold that polygraph results were *per se* inadmissible. In order to address this issue, the court designated a district court judge to hold hearings "for the limited purpose of conducting an evidentiary hearing as to the scientific reliability of polygraph evidence." *Lee v. Martinez*, 96P3dat293. The district court held several days of hearings in which nationally recognized experts testified both for and against repeal of Rule 11-707. The New Mexico Supreme Court, in a *de novo* review of the evidence presented and after undertaking an extensive *Daubert* analysis,¹¹ held that polygraph results are sufficiently reliable to be admitted under New Mexico's Rule 11-702, as long as the expert is qualified and the examination was conducted in accordance with New Mexico's Rule 11-707.

In so holding, the New Mexico Supreme Court noted that "criticism of the polygraph was better addressed in cross-examination, presentation of rebuttal evidence, and argumentation." *Lee v. Martinez*, 96. P.3d at 306. The court further noted that their reaffirmation of Rule 11-707 was based, in part, "on principles of fairness" observing that "[o]ften the same government officials who vigorously oppose the admission of exculpatory polygraphs of the accused find polygraph testing to be reliable enough to use

¹⁰ These provisions are discussed in more detail in Section 11(B), *infra*.

¹¹ New Mexico follows a *Daubert*-type analysis for admissibility of expert testimony. See *State v. Alberico*, 861 P.2d 192 (N.M. 1993).

in their own decision-making." *Id.*

II. APPLYING FRE 702 AND DAUBERT, POLYGRAPH EVIDENCE SHOULD BE ADMISSIBLE.

A. POLYGRAPH THEORY AND TECHNIQUE IS TESTABLE, HAS BEEN SUBJECT TO PEER REVIEW AND PUBLICATION, AND HAS A KNOWN ACCURACY RATE.

1. The Polygraph Instrument and Testing Technique.

As previously observed, the polygraph instrument and testing technique used for modern physiological assessment of deception bears little similarity to the instrument and technique assessed by the court in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923). The modern polygraph instrument "record[s] measures from at least three physiological systems that are controlled by the autonomic nervous system." Honts & Quick, *The Polygraph in 1995*, at 989-90. As summarized in *Galbreth*, 908 F.Supp. at 883:

It measures respiration at two points on the body; on the upper chest, the thoracic respiration, and on the abdomen, the abdominal respiration. Movements of the body associated with breathing are recorded such that the rate and depth of inspiration and expiration can be measured. The polygraph machine also measures skin conductance or galvanic skin response. Electrodes attached to the subject's fingertip or palm of the hand indicate changes in the sweat gland activity in those areas. In addition, the polygraph measures increases in blood pressure and changes in the heart rate. This measurement, known as the cardiovascular measurement, is obtained by placing a standard blood pressure cuff on the subject's upper arm. Finally, the polygraph may also measure, by means of a plethysmograph, blood supply changes in the skin which occur as blood vessels in the skin of the finger constrict due to stimulation.

See also D. Olsen et al., *Recent Developments in Polygraph Technology*, 12 Johns Hopkins Applied Physics Laboratory, Technical Digest 347, 348 (1991) [hereinafter Olsen et al., *Recent Developments*]; D. Weinstein, *Anatomy and Physiology for the Forensic Psychophysicologist*, Department of Defense Polygraph Institute (1994). There is little controversy in the scientific

literature regarding the accuracy of these recordings of physiological responses. 1 P. Giannelli & E. Imwinkelried, *Scientific Evidence* 217 (2d ed. 1993) [hereinafter Giannelli & Imwinkelried, *Scientific Evidence* 2d].

Stated briefly, the scientific theory underlying modern polygraph assessment of deception is that due either to "cognitive processing or emotional stress," there are recordable and measurable physiological reactions to deceptive responses, such as a response to a question involving the matter under investigation which the subject is unable to inhibit. Olsen et al., *Recent Developments*, at 347. As described in *Galbreth*, 908 F.Supp. at 884:

the underlying scientific theory upon which the modern polygraph technique is based is derived from the notion that if a person is threatened or concerned about a stimulus or question, such as a question addressing the matter under investigation, that this concern will express itself in terms of measurable physiological reactions which the subject is unable to inhibit and which can be recorded on a polygraph instrument.

Even the opponents of polygraph generally concede that people experience "emotional turmoil" when they are telling a lie and that these emotions can be charted on a polygraph machine. *See Lee v. Martinez*, 96 P.3d at 299.

Until approximately 1950, most polygraph testing used the relevant/irrelevant (RA) question format. McCall, *Misconceptions and Reevaluation*, at 378. Generally, the R/I test compares the relative physiological reactivity of irrelevant questions (questions not related to the matter under investigation) and relevant questions (questions pertaining to the matter under investigation). *Id.* at 410 n.333. Since its development in 1947, the control question (CQ) format¹² has been the most widely used and studied polygraph technique.¹³ Rather than comparing the

12 J. Reid, A Revised Questioning Technique in Lie-Detection Tests, 37 J. Crim. L. & Criminology (1947). The CQ format is, today, a family of related techniques, all derived from Reid's original procedure.

¹³ The R/I continues to be a popular technique in employee screening situations. P. Minor, The Relevant-Irrelevant Technique, *The Complete Polygraph Handbook* 143 (S. Abrams ed. 1989).

relative physiological reactivity of relevant and irrelevant questions, the CQ technique compares relative physiological reactivity of deceptive responses to troubling but inconsequential questions (control question) and relevant questions. The CQ test is summarized as follows:

In the CQ test, the subject is asked to answer a number of "control"* (meaning stressful, but logically distinct from the incident that is the subject of the examination) questions that are intended to provoke anxiety and a false denial. Thus, if the person being examined is suspected of committing a theft on January 10, 1996, a valid control question would be, "During the five year period from January 1, 1991, to December 31, 1995, do you remember stealing anything?" The assumption is that the subject will answer in the negative but suffer some doubts and experience anxiety (and show strong physiological reaction) in considering the question. Relevant questions relating to the incident under investigation ("Did you steal the wallet of your coworker on January 10, 1996?") are interspersed among the control questions. An innocent subject will show significantly less physiological reaction when truthfully denying the relevant questions than when denying the control questions.

Id. at 411 n. 339. Irrelevant questions are interspread as buffers. Olsen, et al., *Recent Developments*, at 348.

A standard polygraph examination consists of a pre-test interview, polygraph testing, and analysis of the polygraph data. The pre-test interview serves a variety of functions, including: to "acquaint the subject with the effectiveness of the technique," thus allaying the apprehensions of the truthful subject and stimulating the deceptive subject's concern about the prospect of detection; to "assess the suitability of the subject for testing"; and to develop information for formulation of polygraph test questions. Giannelli & Imwinkelried, *Scientific Evidence* 2d, at 219 (footnotes omitted). The court in *Galbreth* describes additional functions of the pre-test interview as: introduction of the control question in such a way as to elicit a deceptive response; advance review of questions to avoid surprise; to prevent the need of the subject to analyze the meaning of a question; and to ensure the understanding of any terms used in the questions. *Galbreth*, 908 F.

Supp. at 884-885.¹⁴

The examination is ordinarily conducted in a testing room, devoid of external distractions. S. Abrams, *The Complete Polygraph Handbook* 37 (1989). During the actual examination, a series of tests,¹⁵ asking the same questions but in a different order, are given. This is to ensure that there is a consistent physiological response to the same questions, thus reducing the potential that outside stimuli influence test results. *Id.* at 71. Physiological responses are recorded on a moving chart. During the testing, the examiner makes appropriate markings on the chart to indicate where each question is asked and answered and whether there are interfering factors which occurred that may have affected a subject's response to particular questions. *Id.* at 37.

Test interpretation is made by comparing the relative reactivity to control and relevant questions. A numerical scoring system is ordinarily employed which literally calls for measuring and comparing the rise and duration of physiological response. *Id.* at 74. Hence, judgments about the difference between responses to the relevant and control questions are minimized. In the last two decades, algorithms have been developed which allow computer-assisted chart interpretation. Olsen et al., *Recent Developments*, at 349.

Quality control, in the form of "blind" chart interpretation by a non-examining polygrapher, without knowledge of the original examiner's conclusions, is often employed by private examiners and typically employed by federal agency examiners to ensure agreement in interpretation. *See* Giannelli & Imwinkelried, *Scientific Evidence* 2d, at 223. A polygraph test may be interpreted as no deception indicated (NDI), deception indicated (DI), or inconclusive (IC).

¹⁴ With regard to concerns that physiological responses to accusatory questions might be confused with responses caused by other emotions, the pre-test interview is designed to minimize physiological responses due to these other emotions or extrinsic factors. This, along with a properly constructed testing room, the repetition of the test in two or more charts, and the post-test interview further serve to minimize extrinsic factors affecting the test. The success of minimizing these factors is demonstrated in the high accuracy rates reported for polygraph testing in the scientific literature.

¹⁵ Typically, two to five charts (test repetitions) are obtained. Olsen et al., *Recent Developments*, at 347; Giannelli & Imwinkelried, *Scientific Evidence* 2d, at 221.

Typically, following a polygraph examination, a post-test interview is conducted in which the results of the polygraph are conveyed to the subject and the subject is interviewed to determine, in part, if there was any external stimuli that may have influenced the test. S. Abrams, *The Complete Polygraph Handbook* 85 (1989).

2. Scientific Study of the Polygraph, Peer Review, and Error Rates.

In 1983, 1984, and 2002, three federally-sponsored reviews of the then available scientific literature regarding polygraph were issued. Each of these reviews considered the status and quality of scientific research regarding polygraph and extensively discussed the evidence regarding the error rate of polygraph.

The first review was issued by the Office of Technology Assessment of the U.S. Congress. U.S. Congress, Office of Technology Assessment, *Scientific Validity of Polygraph Testing: A Research Review and Evaluation*, OTA-TM-H-15 (1983) [hereinafter OTA Report]. The second was issued by the U.S. Department of Defense. U. S. Department of Defense, *The Accuracy and Utility of Polygraph Testing 2* (1984) [hereinafter DoD Report]. The third was issued by the National Academy of Science. National Academy of Science, *The Polygraph and Lie Detection* (2003) [hereinafter NAS Report]. Each of these reviews is considered herein along with additional reviews of some of the more recent scientific literature.

In February 1983 the Committee of Government Operations, U.S. House of Representatives, in response to a Presidential National Security Decision Directive (NSDD-84) which authorized increased use of polygraph examinations for security screening of federal employees and civilian contractors with access to highly classified information, formally requested the Office of Technology Assessment of the U.S.

Congress to conduct a review of the scientific literature on the validity of polygraph testing.

The OTA determined that there were ten field studies¹⁶ and fourteen analog studies¹⁷ on the validity of the CQ which met their scientific criteria. OTA Report at 97. Summarizing their review, the OTA found that those studies employing the CQ in specific incident criminal investigations found average accuracy rates in field studies of 86.3% correct detection of guilty subjects and 76% correct detection of innocent subjects. *Id.* In analog studies, the accuracy was 63.7% correct detection of guilty subjects and 57.9% correct detection of innocent subjects. *Id.* However, these average accuracy results were skewed down as the OTA chose to identify inconclusive findings as errors on the basis that "an inconclusive is an error in the sense that a guilty or innocent person has not been correctly identified." *Id.* The OTA acknowledged that exclusion of inconclusives would raise the overall accuracy rate.¹⁸ *Id.* The OTA did acknowledge, though critical of its study selection, a then recent "important review" which found an average field study validity of 97.2% and analog study validity of 93.2%. *Id.* at 41, *citing*. Ansley, *Review of the Scientific Literature on the Validity, Reliability and Utility of*

¹⁶ "Field studies investigate actual polygraph examinations and constitute the most direct evidence for polygraph test validity." OTA Report at 47 (endnote omitted). The primary problem in field studies is establishing ground truth, i.e., objectively determining the actual truth-tellers so they may be compared with the test outcomes.

¹⁷ Analog, or laboratory, studies are investigations in which field methods of polygraph examinations are used in simulated situations. OTA Report at 61. Analog studies are typically conducted by having a portion of the subjects commit a mock crime and instructing them to lie about it during the polygraph test. Most crime studies are sometimes criticized for their lack of real-life application. This problem is reduced by offering incentives associated with the outcome of the test. Moreover, establishing the usefulness of scientific evidence is often modeled in laboratory studies.

¹⁸ While inconclusives may impact the utility of the polygraph, they do not impact accuracy inasmuch as an inconclusive decision would not reflect a bad judgment but, rather, reflects insufficient information to make a decision. As explained in the DoD Report at 61:

Even the most accurate test has diminishing utility as the inconclusive rate increases. Fingerprints, for example, have limited utility in investigations despite their extremely high accuracy because only occasionally can identifiable prints be recovered.

Polygraph Techniques (Ft. Meade, Md.: National Security Agency (1983)) (found at 125 n.7).

The OTA determined that personnel security screening involved "a different type of polygraph test than specific-incident investigations" and observed that "very little screening research has been conducted" and, for that reason, found that the scientific basis for the use of polygraph for personnel screening was not established. OTA Report at 99-100. The OTA did determine that

[t]he preponderance of research evidence does indicate that, when the control question technique is used in specific-incident criminal investigations, the polygraph detects deception at a rate better than chance, but with error rates that could be considered significant.

Id. at 97. The OTA urged further research and set out priorities for such research. *Id.* at 101-102.

In 1984, at the request of the Deputy Under Secretary of Defense, the Department of Defense issued a report which surveyed the then existing scientific literature regarding polygraph testing. DoD Report at 2. Observing that there has been more scientific research conducted on polygraph testing "in the last six years than in the previous 60 years," the authors of the DoD Report included a larger group of studies in its review than did the authors of the OTA Report. *Id.* at 58. Field studies reviewed demonstrated 90 to 100 percent accurate classification of guilty subjects and 85 to 100 percent accurate classification of innocent subjects after exclusion of inconclusive results. *Id.* at 37-38. Analog studies were found to

correctly classify from 75% to 100% of the guilty subjects and from 57% to 100% of the innocent subjects. The mean correct classification rate weighed for number of subjects in the study is 90% for guilty subjects and 80% for innocent

subjects.

Id. at 62. In its overview, the DoD observed that while there were some limitations on the scientific research, "the research produces results significantly above chance." *Id.* at 3.

Following the OTA Report and DoD Report, there were significant technological advances in polygraph instrumentation and an increase in research in the field of physiological detection of deception and better education and training of examiners:

The period between 1986 and the present has been one of unparalleled advances in the psychophysiological detection of deception testing procedures and processes. . . . More sensitive sensors; more efficient transducers; improved means of digitizing and recording physiological data; digitizing analog data at increasingly high sample rates; and algorithms to evaluate physiological data in an unlimited fashion, all represent technical innovations that will enhance the advancement of the new and evolving science of forensic psychophysiology.

W. Yankee, *The Current Status of Research in Forensic Psychophysiology and Its Application in the Psychophysiological Detection of Deception*, 40 J. Forensic Sci. 63, 63 (1995) [hereinafter Yankee, *The Current Status*].

Under the Defense Authorization Act of 1986, the Secretary of Defense was directed to carry out research in the field of physiological detection of deception. Additionally, in 1986, Department of Defense Directive 5210.78 established the Department of Defense Polygraph Institute (DoDPI) as a higher education and research facility. Yankee, *The Current Status*, at 63. Summaries of DoDPI's research are contained in its annual reports to Congress.¹⁹

In its Annual Report to Congress for Fiscal Year 1990, DoDPI summarized a

¹⁹ In Yankee, *The Current Status*, the author cites a number of studies either conducted, administered, or contracted by DoDPI.

report prepared by the National Security Agency which reviewed polygraph field studies conducted since 1980. That report, subsequently published in *Polygraph*,²⁰ considered ten field studies.²¹ The ten studies reviewed considered a total of 2,042 examiner decisions, and the results, although excluding inconclusives, assumed that every disagreement was a polygraph error. Average accuracy was 98%. Ansley, *The Validity and Reliability*, at 177. Table 1 of the report sets forth, in part, the following results:

20 Ansley, *The Validity and Reliability of Polygraph Decisions in Real Cases*, 19 *Polygraph* 169 (1990) [hereinafter Ansley, *The Validity and Reliability*].

21 L. Arellano, *The Polygraph Examination of Spanish Speaking Subjects*, 19 *Polygraph* 155 (1990); R. Edwards, *Survey: Reliability of Polygraph Examinations Conducted by Virginia Polygraph Examiners*, *Polygraph* 229 (1981); E. Elaad & E. Schahar, *Polygraph Field Validity*, 14 *Polygraph* 217 (1985); J. Matte & R. Reuss, *A Field Validation Study of the Quadri-Zone Comparison Technique*, 18 *Polygraph* 187 (1989); K. Murray, *Movement Recording Chairs: A Necessity?*, 18 *Polygraph* 15 (1989); C. Patrick & W. Iacono, *Validity and Reliability of the Control Question Polygraph Test: A Scientific Investigation*, 24 *Psychophysiology* 604 (1987); R. Putnam, *Field Accuracy of Polygraph in the Law Enforcement Environment* (1983), printed in 23 *Polygraph* 260 (1994); D. Raskin et al., *Validity of Control Question Polygraph Tests in Criminal Investigation*, 25 *Psychophysiology* 474 (1988); J. Widacki, *Analiza Przystanek Diagnozowania W. Badanich Poligraficznych* (The Analysis of Diagnostic Premises in Polygraph Examinations), Uniwersytetu Slaskiego, Katowice (text in Polish) (1982); Takehiko Yamamura & Yoichi Miyake, *Psychophysiological Evaluation of Detection of Deception in a Riot Case Involving Arson and Murder*, 9 *Polygraph* 170 (1980).

TABLE 1
Validity of Examiners' Decisions (inconclusives excluded)

<u>Authors/Dates</u>	<u>Total # / # Correct / %</u>		
Arellano (1990)	40	40	100%
Edwards (1981)	959	943	98%
Elaad/Schahar (1985)	174	168	97%
Matte/Reuss (1989)	114	114	100%
Murray (1989)	171	168	98%
Patrick/Iacono (1987)	81	78	96%
Putnam (1983)	285	281	99%
Raskin et al. (1988)	85	81	95%
Widacki(1982)*	38	35	92%
Yamamura/Miyake (1980)	95	85	89%
TOTALS	2042	1993	98%

* Only the totals reported

Ansley, *The Validity and Reliability*, at 171.

In late 2002, the NAS Report was issued. The NAS was commissioned, similar to the OTA in 1983, to address the use of polygraph as a screening tool for national security purposes. Despite finding polygraph to be an "imperfect instrument," and leveling certain criticisms of polygraph use for national security screening, the NAS reported that on the basis of scientific studies selected by NAS as meeting their scientific standards, polygraph accuracy was in the high 80th percentile.

The NAS Report identified 194 separate studies regarding polygraph validity. NAS Report at 107. Of those, 102 were deemed of sufficient quality to be included in the committee's review of polygraph. Of those, the NAS determined that 57 were of sufficiently high quality for use in their review. NAS Report at 108. Even excluding 137 studies from use in their review, inclusion of which would have likely increased the overall accuracy of polygraph, NAS found that in analog studies, polygraph accuracy was

between 81 % and 91 % with a median accuracy index of 86%. NAS Report at 122. In field studies, polygraph accuracy was in the range of 71% to 99%, with a median accuracy index of 89%. NAS Report at 125.

While the NAS committee was critical of many aspects of polygraph, the fact that the committee endorsed 57 studies as meeting their criteria for sufficiently high quality of research and that such studies reported accuracy between 81 % and 91 % cannot be ignored. Further, as noted by NAS, a "sizeable number" of the polygraph research studies involved in their consideration "appeared in good-quality peer-reviewed journals." NAS Report at 108. In fact, it is important to note that in the 20 years since the OTA Report, which determined there were then only 24 studies meeting acceptable scientific methodology research, 57 such studies meeting acceptable scientific methodology were identified by NAS. Moreover, the finding of median accuracy of 86% to 89% is an increase over the observation of the OTA²² and is statistically similar to the results found in the DoD Report and is similar to other reviews of scientific literature.²³ Indeed, in a 1997 review of four CQ field studies, determined by the authors to meet the criteria for meaningful field studies, the average accuracy of field decisions for the CQ was 90.5%.²⁴

D. Raskin et al., *Polygraph Tests: The Scientific Status of Research on Polygraph*

²² NAS did not, as did OTA, consider inconclusive results an error.

²³ It is also noteworthy that the NAS committee determined that polygraph remains the only viable scientific method for the detection of deception. As noted by the committee: Some potential alternatives to the polygraph show promise, but none has yet been shown to outperform the polygraph. None shows any promise of supplanting the polygraph for screening purposes in the near term. NAS Report at 708.

²⁴ Those field studies were cited by Raskin et al. as follows: C. Honts, *Canadian Police Research Centre Field Validity Study of the Canadian Police College Polygraph Technique* (1994) [an abstract of this study appears in C. Honts, *Field Study of the Canadian Police College Polygraph Technique*, 31 *Psychophysiology* 557]; C. Honts & D. Raskin, *A Field Study of the Validity of the Directed Lie Control Question*, 16 *J. Police Sci. & Admin.* 56 (1988); C. Patrick & W. Iacono, *Validity of the Control Question Polygraph Test: The Problem of Sampling Bias*, 76 *J. Applied Psychol.* 229 (1991); Raskin et al., *A Study of the Validity of Polygraph Examinations in Criminal Investigations*, National Institute of Justice (1988). Raskin et al., *Polygraph Tests: The Scientific Status*, at 574 n.38.

Techniques: The Case for Polygraph Tests, § 14-2.2.1 at 575, in *1 Modern Scientific Evidence: The Law and Science of Expert Testimony* (D. Faigman et al. eds., 1997) [hereinafter *Raskin et al., Polygraph Tests: The Scientific Status*]. The accuracy rose to 95.5% when one study, for which the authors had some criticism, was excluded. *Id.*

In another review, while considering eleven analog studies, S. Abrams, *The Complete Polygraph Handbook* 190-191 (1989), found that, excluding inconclusives, overall accuracy of the CQ was "in the range of 87 percent."²⁵

The author observed that "[t]he findings for the CQT in the laboratory, for all of its weaknesses, indicates both high validity and reliability." *Id.* at 191.

In Raskin et al., *Polygraph Tests: The Scientific Status*, the authors reviewed eight "high quality" analog studies of the CQ which had been reported between 1978 and 1994.²⁶ The average accuracy of these CQ analog studies correctly classified approximately 90% of the subjects. *Id.* at §14-2.2.1 at 572.

²⁵ Those studies were cited by Abrams as follows: D. Raskin & R. Hare, *Psychopathy and Detection of Deception in a Prison Population*, 15 *Psychophysiology* 126 (1978); D. Hammond, *The Responding of Normals, Alcoholics, and Psychopaths in a Laboratory Lie-Detection Experiment*, California School of Professional Psychology (1980) (unpublished doctoral dissertation); J. Widacki & F. Horvath, *An Experimental Investigation of the Relative Validity and Utility of the Polygraph Technique and Three Other Common Methods of Criminal Identification*, 23 *J. Forensic Sci.* 596 (1978); L. Rovner et al., *Effects of Information and Practice on Detection of Deception*, paper presented at Society for Psychophysiological Research (Madison, Wisconsin, 1979), printed in 16 *Psychophysiology* 197 (1979); C. Honts & R. Hodes, *The Effects of Simple Physical Countermeasures on the Physiological Detection of Deception*, 19 *Psychophysiology* 564 (1982) (abstract); C. Honts & R. Hodes, *The Effects of Multiple Physical Countermeasures on the Detection of Deception*, 19 *Psychophysiology* 564 (1982) (abstract); R. Gatchel et al., *The Effect of Propranolol on Polygraphic Detection of Deception*, University of Texas Health Sciences Center (1983) (unpublished manuscript); G. Barland & D. Raskin, *An Evaluation of Field Techniques in Detection of Deception*, 12 *Psychophysiology* 321 (1975); J. Podlesny & D. Raskin, *Effectiveness of Techniques and Physiological Measures in the Detection of Deception*, 15 *Psychophysiology* 344 (1978); J. Kircher & D. Raskin, *Computerized Decision-Making in Physiological Detection of Deception*, 18 *Psychophysiology* 204 (1981); G. Barland, *A Validation and Reliability Study of Counterintelligence Screening Test*, Security Support Battalion, 902d Military Intelligence Group, Fort George G. Meade, Maryland (1981). S. Abrams, *The Complete Polygraph Handbook* 246-249 (1989).

²⁶ Those analog studies were cited by Raskin et al. as follows: A. Ginton et al., *A Method for Evaluating the Use of the Polygraph in a Real-Life Situation*, 67 *J. Applied Psychol.* 131 (1982); C. Honts et al., *Mental and Physical Countermeasures Reduce the Accuracy of Polygraph Tests*, 79 *J. Applied Psychol.* 252 (1994); S. Horowitz et al., *The Directed Lie: Standardizing Control Questions in the Physiological Detection of Deception* (in press, *Psychophysiology*); J. Kircher & D. Raskin, *Human Versus*

There has been criticism of polygraph on the basis of attempted countermeasures. However, it is important to note that at least one study found that subjects who are given information on countermeasures and who are not actually trained in their use have been shown to be unable to significantly affect the accuracy of the polygraph. Id.; L. Rovner, *The Accuracy of Physiological Detection of Deception for Subjects with Prior Knowledge*, 15 *Polygraph* 1 (1986). A recent commentator on polygraph testing observed that, given the different test formats, a polygraph subject seeking to employ countermeasures would face a major obstacle of knowing the test format in advance and/or learning to identify each of the various formats. As set out in D. Krapohl, *The Polygraph in Personnel Screening*, *Handbook of Polygraph Testing*, 226-27 (Murray Kleiner ed., 2002) [hereinafter Krapohl, *Polygraph in Personnel Screening*]:

A countermeasure appropriate against one type of screening format may doom an examinee when used on another format. The selection of an anti-polygraph strategy becomes problematic for the would-be countermeasurer unless the test format were known in advance. Lacking this inside knowledge, the examinee would have to learn to identify all likely test formats, predict the decision criteria, and then successfully employ the correct ensemble of countermeasures without being detected. Such a goal is certainly attainable for some individuals, but it would entail substantially more countermeasure training than if the objective were to defeat a known testing technique.

Moreover, the potential that a person might consciously attempt to affect the outcome of a test is not unique to polygraph.

Computerized Evaluations of Polygraph Data in a Laboratory Setting, 73 *J. Applied Psychol.* 291 (1988); J. Podlesny & D. Raskin, Effectiveness of Techniques and Physiological Measures in the Detection of Deception, 15 *Psychophysiology* 344 (1978); J. Podlesny & C. Truslow, Validity of an Expanded-Issue (Modified General Question) Polygraph Technique in a Simulated Distributed-Crime-Roles Context, 78 *J. Applied Psychol.* 788 (1993); D. Raskin & R. Hare, Psychopathy and Detection of Deception in a Prison Population, 15 *Psychophysiology* 126 (1978); L. Rovner et al., Effects of Information and Practice on Detection of Deception, 16 *Psychophysiology* 197(1979). Raskin et al., *Polygraph Tests: The Scientific Status*, §14-2.2.1 at 572 n.33.

Many other criticisms of polygraph accuracy have been rebutted by empirical data. See J. Buckley & L. Senese, *The Influence of Race and Gender on Blind Polygraph Chart Analyses*, 20 Polygraph 247 (1991) (no significant difference in polygraph accuracy due to subjects' race or gender); D. Raskin & R. Hare, *Psychopathy and Detection of Deception in a Prison Population*, 15 Psychophysiology 126(1978) (no significant difference in polygraph accuracy between psychopaths and non-psychopaths); but see M. Floch, *Limitations of the Lie Detector*, 40 J. Crim. Law & Criminology 651 (1950); S. Abrams, *The Validity of the Polygraph Technique with Children*, 3 J. Police Sci. & Admin. 310 (1975) (children over the age of eleven have high polygraph accuracy with accuracy rates dropping at lower ages); D. Raskin (Ed), *Psychological Methods in Criminal Investigation and Evidence* 253 (1989) (drugs have minimal effect on polygraph outcome); but see W. Waid et al., *Meprobamate Reduces Accuracy of Physiological Detection of Deception*, 212 Science 71 (1981).

Polygraph has also been criticized on the argument that there is an unknown base rate of liars. Base rate refers to the percentage of occurrence of the behavior of interest in the examination procedure. As an illustration, in a national security setting, the behavior of interest may be whether the applicant is a spy. If you assume an applicant pool of 1,000 with a 1 % (10) population of spies, polygraph testing with an accuracy of 90% would catch 9 of the 10 spies. However, such polygraph testing would misidentify 91 applicants who were not spies as deceptive (false positives). Critics of polygraph extrapolate that there is a significantly higher error rate (roughly 9 to 1) of applicants misidentified as deceptive to the number of identified spies.

The significance of the base-rate argument is found in the arena of screening examinations and is, at best, misplaced in the debate over the use of evidence of specific-issue testing. In fact, the NAS Report, in referring to this base-rate argument, notes that the importance of the base rate is "strikingly different in event-specific screening applications." NAS Report at 208.²⁷

In specific-issue testing, the base-rate issue adds unnecessary confusion to the question of polygraph validity, as it ignores the overall validity of the polygraph and seeks to compare accuracy to an artificially created population. Base-rate analysis can be used in the same way to argue against any scientific evidence which is not 100% accurate. Indeed, as noted by Krapohl, *Polygraph in Personnel Screening*, at 231:

The base rate argument as currently framed gives rise to more confusion than clarity and contributes very little by itself to the debate.

In the end, as noted by the New Mexico Supreme Court in *Lee v. Martinez*, 96 P.3d at 302, "the base rate has no effect on the reliability of the polygraph."

Comparison of the reliability of polygraph evidence to other scientific evidence is worthwhile. In 1978, one study found that polygraph evidence is more reliable than other evidence traditionally admitted at trial. J. Widacki & F. Horvath, *An Experimental Investigation of the Relative Validity and Utility of the Polygraph Technique and Three Other Common Methods of Criminal Identification*, 23 J. Forensic Sci. 596 (1978).

There, eighty volunteer subjects were divided into twenty groups of four. In each group, one was assigned to pick up a parcel from one of two doorkeepers of a building. Each of

²⁷ Even in the screening arena, however, this argument is not well-founded. First, it does not diminish the science or validity of the polygraph. Second, it fails to recognize the balancing of interest between the need to identify spies and the tolerance for false positives. Some may argue that a cost of 91 false positives is too much to catch even one spy. However, this is a political decision which does not impact the validity of polygraph.

the twenty subjects brought an information sheet and envelope and left them with the doormen. Each subject signed a form in order to receive the package. The doormen knew in advance that participants would be coming. All eighty subjects were fingerprinted and provided handwriting samples. The doormen were each presented a set of four pictures and were required to select the person from each group who had picked up the package. A handwriting expert sought to identify the handwriting of the perpetrator from each group. A fingerprint expert sought to identify the perpetrator by lifting fingerprints from the envelopes and forms left with the doormen. A polygraphist examined each set of four subjects and made a decision as to who was the perpetrator.

Widacki & Horvath found that, excluding inconclusives, the fingerprint expert was correct in 100% of his decisions, the polygrapher was correct in 95% of his decisions, the handwriting expert was correct in 94% of his decisions, and the eyewitness was correct in 64% of his decisions. Interestingly, when inconclusives were included, the percentage of correctly resolved cases changed to 90% polygraph, 85% handwriting, 35% eyewitness, and 20% fingerprint.

Similar to the findings of Widacki & Horvath study, a recent literature review performed a comparative analysis with regard to the accuracy of polygraph as compared with other medical and psychological diagnostic tools. *See Crewson, Comparative Analysis of Polygraph With Other Screening and Diagnostic Tools*, 32 *Polygraph* 2 (2003) [hereinafter Crewson, *Comparative Analysis of Polygraph*].

There, Crewson found that the polygraph, in specific-issue testing, had a similar accuracy to diagnostic radiology and better accuracy than psychological diagnostic tools. *Id.* at 63. Crewson sets out the accuracy of polygraph with other diagnostic instruments

by assessment in the instrument's ability to assess a target condition in the following table:

Table 6: Rank Ordered "Combined Accuracy" on
Common Medical and Psychological Diseases

Average Accuracy

Target Condition	Technique	Sensitivity (TPR)	Specificity (TNR)	Combined Accuracy	Number of Studies
Acute Appendicitis	CT (Computerized Tomography)	.95	.98	.96	5
Brain Tumor	MRI (Magnetic Resonance Imaging)	.93	.98	.95	2
Carotid Artery Disease	US (Ultrasound)	.89	.93	.91	14
Acute Appendicitis	US	.84	.97	.91	2
Breast Cancer	US	.92	.87	.90	3
Deception	Polygraph	.92	.83	.88	37
Breast Cancer	MRI	.98	.74	.86	3
Breast Cancer (Screen)	Plain Film	.79	.92	.86	4
Multiple Sclerosis	MRI	.73	.93	.83	2
Breast Cancer	Plain Film	.78	.83	.80	7
Alcohol Abuse	MAST*	.80	.78	.79	4
Deception (Screen)	Polygraph	.59	.90	.74	2
Personality Disorders	DSM-IV** (Statistical Manual of Mental Disorders)	.84	.60	.72	3
Depression	MMPI	.68	.65	.67	25

	(Multiphasic Personality Disorder)				
--	--	--	--	--	--

* Also Included a study using MMPI

** Also Included studies using ICD-10 and a Personality Index

As is apparent from the Widacki & Horvath study and Crewson review, specific-issue polygraph testing demonstrates more accuracy than much other evidence which is routinely admitted in the courts.

As previously observed, opponents of polygraph have singled the polygraph out from other diagnostic tools and evidence and seek to impose standards which are not imposed upon other evidence. As noted by Crewson:

There has been much debate over the past 30 years about polygraph and its accuracy, reliability, utility, and lack of theoretical foundation. It should be recognized from this literature review, however, that many of these same issues could be raised about medical and psychological diagnostic tools.

Crewson, *Comparative Analysis of Polygraph*, at 68. However, as concluded by Crewson: "The level of accuracy and agreement reported in the polygraph literature is consistent with the medical and psychological literature." *Id.* at 70. In fact, the NAS Report conceded that the studies that the committee has accepted as scientifically acceptable "report accuracy levels comparable to various diagnostic tests used in medicine." NAS Report at 149.

B. STANDARDIZATION OF POLYGRAPH EXAMINATIONS AND THE EDUCATION AND TRAINING OF POLYGRAPH EXAMINERS.

Considerable emphasis has been made on improving the education and training of polygraph examiners. Initially, using the Air Force polygraph training program as a model,²⁸ DoDPI now offers an academic curriculum for federal examiners that

provides a basis for a thorough understanding of the scientific psychological, physiological, and psychophysiological concepts, systems, processes, and applications involved; as well as the scientific bases for test development, standardized test administration, research methodology, statistics and ethics.

Yankee, *The Current Status*, at 63. In addition to completing the DoDPI training, a candidate for a DoD polygraph examiner must be "a graduate of an accredited four-year college or have equivalent experience that demonstrates the ability to master graduate-level academic courses," have two years law enforcement investigative experience, be of high moral character as confirmed by background investigation, and complete a minimum of six months on-the-job internship. *U.S. Department of Defense Polygraph Program: Annual Polygraph Report to Congress for Fiscal Year 1996*, at 14. Currently, all federal agencies receive their basic polygraph training at DoDPI. *Id.* Further, all federal examiners are required to complete eighty hours of continuing education every two years. *Id.* at 15.

Numerous states now provide for licensing of polygraphers. See Giannelli & Imwinkelried, *Scientific Evidence* 2d at 219; Ansley & Vaughan, *Polygraph Quick Reference Guide to the Law*, 17th ed., American Polygraph Association (2002). Some of

²⁸ U.S. Department of Defense Polygraph Program: Report to Congress for Fiscal Year 1986, reprinted in 16 Polygraph 53, 63 (1986) (the "Air Force program has served as a model for our expansion and the characteristics which made it worthy of emulation are now standard throughout DoD").

these states require continuing education for examiners. *Id.* New Mexico is a leading state in its training requirements for polygraph examiners and, as noted, has adopted a rule of evidence requiring stringent minimum qualifications for polygraphers who testify as experts. *See* N.M.R.E. 11-707(B) (requiring a minimum of five years experience in administration and interpretation of polygraph test and successful completion of twenty or more hours of continuing education in the field of polygraphy during the twelve-month period immediately prior to the date of subject examination).

Polygraphers who are full members of the American Polygraph Association ("APA") must have graduated from an APA-accredited polygraph school,²⁹ completed no less than 200 actual polygraph examinations in a standardized polygraph technique, hold a current valid license to practice polygraphy issued by the state or federal agency requiring such license, and received a bachelor's degree from a college or university accredited by a regional accreditation board. *See* Bylaws of the American Polygraph Association, Division V, ¶ 5.1. The APA also conducts various regional and national seminars on polygraphy for its members. Giannelli & Imwinkelried, *Scientific Evidence* 2d at 219.

The APA has established detailed standards of practice and ethics for its members. The New Mexico Supreme Court in *Lee v. Martinez*, noting the APA-developed protocol standards for polygraph, wrote:

Under these standards, prior to examination, the polygraph examiner must make a reasonable effort to determine whether an examinee is fit for polygraph testing by inquiring into the medical and psychological condition of the examinee, as well as any recent drug use by the

²⁹ The APA has, for some time, administered an accreditation program for polygraph schools. Giannelli & Imwinkelried, *Scientific Evidence* 2d at 218. *See also* American Polygraph Association Manual for Polygraph School Accreditation (1997) (on file with the APA).

examinee, APA Standard 3.4.1; the polygraph instruments must be APA approved and have been calibrated, APA Standard 3.5; and a pretest interview must be conducted where the examiner both discusses with the examinee the polygraph process and the issues to be tested and ensures that the examinee recognizes and understands each question, APA Standard 3.8. During the examination, the questions used must be clear and distinct, APA Standard 3.9.3; the questions used must be balanced in terms of length and impact, APA Standard 3.9.4; the examiner must collect a sufficient number of charts, APA Standard 3.9.5; standardized chart markings should be used, APA Standard 3.9.7; and either an audio or audio/video recording of the pretest and in-test phase of the examination must be made, APA standard 3.9.8. As for scoring the chart, the examiner must use numerical scoring, APA standard 3.10.1; and the examiner's notes must have 'sufficient clarity and precision so that another examiner could read them,' APA Standard 3.10.2.

Lee v. Martinez, 96 P.3d at 304.

Similarly, the American Association for Police Polygraphists ("AAPP") has set out standards of practice and ethics. See www.policepolygraph.org/standards.htm.

Recently, important progress has been made with regard to the standardization of polygraph examiners' training and testing through the American Society for Testing Materials (ASTM). See ASTM Standard E 2000098, *Standard Guide for Minimum Basic Education and Training of Individuals Involved in the Detection of Deception* (PDD); ASTM Standard E 2064-00, *Standard Guide for Minimum Continuing Education of Individuals Involved in the Psychophysiological Detection of Deception* (PDD); ASTM Standard E 2062-00, *Standard Guide for PDD Examination Standards of Practice*; ASTM Standard E 2031-99, *Standard Practice for Quality Control of Psychophysiological Detection of Deception (Polygraph) Examination*; ASTM Standard E 2063-00, *Standard Practice for Calibration and Functionality Check Used in Forensic*

Psychophysiological Detection of Deception (Polygraph) Examination; and ASTM Standard E 1954-98, *Standard Practice for Conduct of Research and Psychophysiological Detection of Deception (Polygraph)*.

C. ACCEPTANCE WITHIN THE SCIENTIFIC COMMUNITY.

The Supreme Court in *Daubert* included acceptance within the scientific community as a consideration by which to gauge reliability of scientific evidence. However, the Court specifically held that such acceptance is not a rigid prerequisite to the admissibility of scientific evidence. *See Daubert*, 509 U.S. at 588.

Surveys of attitudes in the scientific community toward polygraph reliability have not come down heavily on one side or another of the debate. Rather, such surveys have indicated that the community is somewhat split on the issue. Four surveys have been conducted that speak to acceptance of the polygraph in the scientific community.

The Gallup Organization conducted a survey of randomly selected members of the Society for Psychophysiological Research in 1982. The Gallup Organization, *Survey of Members of the Society for Psychological Research Concerning Their Opinion of Polygraph Test Interpretation*, 13 *Polygraph* 153 (1984) [hereinafter Gallup Survey]. In that survey, 61% of the respondents agreed that the polygraph is a useful tool when considered with other available information, 32% of the respondents agreed that the polygraph is of questionable usage, and only 3% believed that the polygraph is not useful at all. Gallup Survey at 157.

A follow-up to the Gallup Survey was conducted in 1993. That survey revealed little change in scientific community attitudes toward the polygraph. There, 60% of respondents agreed that the polygraph is a useful tool, 37% agreed it is of questionable

usage, and only 2% believed that it was not useful. Susan L. Amato, *A Survey of Members of The Society for Psychophysiological Research Regarding the Polygraph: Opinions and Implications* (1993) (unpublished Master's thesis, University of North Dakota) (on file with the University of North Dakota Library).

In 1997, a survey was conducted of the Society of Psychophysiological Research and the Fellows of Division 1 of the American Psychological Association. Of those surveyed from the Society of Psychophysiological Research, 36% believed that the control question technique was based on sound scientific theory or principles. Thirty percent (30%) of those responding from the American Psychological Association believed that the control question technique was based on sound scientific theory or principles. W.G. Iacono & D.T. Lykken, *The Validity of the Lie Detector: Two Surveys of Scientific Opinion*, 82 J. of Applied Psychol. 426 (1997).³⁰

Finally, a survey was conducted in 2002 of both the Society for Psychological Research and the American Psychology Law Society. Of those responding to that survey, 96% of the American Psychology Law Society members and 91% of the Society for Psychological Research members believed that polygraph studies published in peer-reviewed journals are based upon generally accepted scientific methods. Honts et al., *General Acceptance of the Polygraph by the Scientific Community* (Mar. 9, 2002) (unpublished paper presented at the meetings of the American Psychology Law Society).³¹

³⁰ It should be noted that this survey was conducted by two of the most outspoken critics of polygraph and has been criticized for bias.

³¹ Similarly, this survey was conducted by an outspoken proponent of polygraph and may also be subject to criticism for bias.

Taking these four surveys into consideration, the New Mexico Supreme Court in *Lee v. Martinez* found:

[W]e cannot conclude that the control question polygraph has been generally accepted within the scientific community. However, we also cannot conclude that the control question polygraph has been uniformly rejected by the scientific community. This factor thus carries little weight in our *Alberico/Daubert* analysis of the control question polygraph.

Lee v. Martinez, 96 P.3d at 306. In light of the United States Supreme Court's holding in *Daubert* that acceptance within the scientific community is not a rigid prerequisite to admissibility, the continued debate within the scientific community should likewise be given little weight in the *Daubert* analysis.

III. THIS COURT SHOULD ADMIT THE POLYGRAPH EVIDENCE FOR THE LIMITED PURPOSE OF DECIDING THE MOTION TO WITHDRAW THE GUILTY PLEA

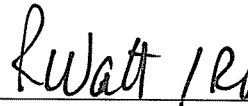
As discussed, *supra*, much of the concern regarding the admissibility of polygraph evidence is the ability of lay jurors to properly interpret the evidence. In this case, however, Mr. Caramadre seeks to have the Court consider the evidence in conjunction with his motion to withdraw his guilty plea; thus, those concerns are not present at this juncture in this case.

This Circuit permits the use of polygraph results in conjunction with plea agreements in order to determine the propriety of a downward departure. *See, e.g., United States v. Santiago-Gonzalez*, 66 F.3d 3 (1st Cir. 1995). This Court should likewise admit this evidence for the limited purpose of its consideration of the motion to withdraw the guilty plea.

Respectfully submitted,
Joseph Caramadre,
By his attorneys,



Randy Olen, Esq.
478A Broadway
Providence, RI 02909
(401) 274-1400
(401) 274-2480 (fax)



Robert D. Watt, Jr., Esq.
84 Ship Street
Providence, RI 02903
(401) 273-0484
(401) 453-4906 (fax)

CERTIFICATION

I hereby certify that on this 4th day of March, 2013, I caused to be delivered, via first class mail, the within *Memorandum of Law* to:

John P. McAdams, Esq.
U.S. Attorney's Office
50 Kennedy Plaza, 8th Floor
Providence, RI 02903

Lee Vilker, Esq.
U.S. Attorney's Office
50 Kennedy Plaza, 8th Floor
Providence, RI 02903

Olin W. Thompson, Esq.
Federal Defender's Officer
10 Weybosset Street, Suite 300
Providence, RI 02903

